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8. The reactor according to Claim 22, wherein said gas injector includes a plurality of orifices through which the ionized gas is delivered into said processing chamber.

C3 9. The reactor according to Claim 22, wherein said gas injector comprises a quartz tube.

C4 11. The reactor according to Claim 22, wherein said gas injector further includes a supply tube and an injection tube, said supply tube in communication with said injection tube, said supply tube for delivering gas to said injection tube, and said plasma generator for ionizing the gas into a gas plasma in said supply tube.

C5 15. The reactor according to Claim 22, wherein said gas injector includes at least two gas injection tubes, one of said gas injection tubes injecting a first gas in said processing chamber, and a second of said gas injection tubes injecting a second gas in said processing chamber, and said gas injector ionizing at least one of said first and second gases into a gas plasma for injecting into said processing chamber.

C6 17. The reactor according to Claim 22, wherein said plasma generator includes a generator tube and a coil inducing an electromagnetic field in said generator tube to ionize the gas flowing through the generator tube, and said generator tube directing the ionized gas to said gas injector for injecting into said processing chamber.

C7 22. A reactor for processing a semiconductor substrate, said reactor comprising:
a reactor housing defining a processing chamber and being adapted to support the substrate in said processing chamber;
a plasma generator for ionizing at least one gas into a gas plasma; and
at least one gas injector, said gas injector being adapted to inject the ionized gas into said processing chamber and onto the substrate supported therein for processing the

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C7

substrate, wherein said housing includes a cover, said gas injector being supported in said cover.

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24. The reactor according to Claim 22, wherein said at least one gas injector comprises at least two gas injectors for injecting at least one gas into said processing chamber.

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33. The method of processing a semiconductor substrate according to Claim 38, wherein said ionizing a gas includes ionizing the gas into plasma.

34. The method of processing a semiconductor substrate according to Claim 38, wherein said ionizing includes applying an electromagnetic field to the gas.

35. The method of processing a semiconductor substrate according to Claim 34, wherein said applying an electromagnetic field includes applying a radio frequency field to the gas.

37. The method of processing a semiconductor substrate according to Claim 38, further comprising rotating the substrate in the processing chamber during processing.

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38. A method of processing a semiconductor substrate comprising:
providing a processing chamber;
supporting the substrate in the processing chamber;
ionizing a gas;
injecting the ionized gas into the processing chamber onto the substrate for processing the semiconductor substrate; and
further comprising measuring the emissivity of the substrate during processing.

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39. The method of processing a semiconductor substrate according to Claim 38, further comprising heating the substrate during processing.

40. The method of processing a semiconductor substrate according to Claim 38, wherein said injecting the ionized gas includes directing the ionized gas onto at least a discrete portion of the substrate.

41. The method of processing a semiconductor substrate according to Claim 38, further comprising injecting a second gas into the chamber onto the substrate for processing the semiconductor substrate.

42. The method of processing a semiconductor substrate according to Claim 41, wherein said injecting a second gas includes directing the second gas onto a discrete portion of the substrate.

43. The method of processing a semiconductor substrate according to Claim 38, further comprising selectively varying the flow of the ionized gas into the processing chamber.

44. The method of processing a semiconductor substrate according to Claim 38, further comprises cleaning the substrate with an ionized gas.

45. The method of processing a semiconductor substrate according to Claim 38, wherein said ionizing a gas includes ionizing silane.

46. The method of processing a semiconductor substrate according to Claim 45, further including ionizing oxygen and injecting the ionized silane and oxygen into the processing chamber.

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47. The method according to Claim 38, wherein said ionizing includes ionizing nitrogen.

48. The method according to Claim 38, wherein said ionizing includes ionizing a fluorine containing gas.

49. The method according to Claim 48, wherein said ionizing a fluorine containing gas includes ionizing one of Freon, NF_3 and XeF_2 .

50. The method according to Claim 38, wherein said ionizing includes ionizing hydrogen.

51. The method according to Claim 38, wherein said ionizing includes ionizing oxygen.

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52. The method according to Claim 38, wherein said ionizing includes ionizing silane and ammonia.

53. The method according to Claim 38, further comprising injecting a reactant gas into the processing chamber.

54. The method according to Claim 53, wherein said ionizing includes ionizing ammonia and injecting a reactant gas includes injecting silane.

55. The reactor according to Claim 30, wherein said heater housing is adapted for supporting the substrate in said processing chamber.

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58. The reactor according to Claim 63, wherein said electromagnetic field generator comprises a plasma generator.

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62. The reactor according to Claim 63, wherein said electromagnetic field generator includes a generator tube in communication with said supply tube, said electromagnetic field generator generating said electromagnetic field in said generator tube to ionize gas flowing into said supply tube into a gas plasma.

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 63. A reactor for processing a semiconductor substrate, said reactor comprising:
 a reactor housing defining a processing chamber and having a substrate support for supporting a substrate in said processing chamber; and
 a gas injection system including an electromagnetic field generator generating an electromagnetic field exteriorly of said processing chamber and for injecting at least one gas into said processing chamber, said gas injection system passing said at least one gas through said electromagnetic field generated by said electromagnetic field generator wherein said gas is ionized exteriorly of said processing chamber, said gas injection system injecting said ionized gas into said processing chamber and onto the substrate supported therein for processing the substrate, said gas injection system including a gas manifold, said substrate support being adapted to rotate said substrate in said processing chamber whereby said gas manifold distributes the ionized gas uniformly over the substrate, said gas injection system further including an injection tube and a supply tube in communication with said injection tube, said injection tube having a plurality of orifices through which the ionized gas is delivered in said processing chamber, said supply tube for delivering the ionized gas to said injection tube, wherein said supply tube has a larger diameter than said generator tube such that the gas undergoes dissociation within said supply tube.

Please enter the following new claims:

78. The reactor according to Claim 63, wherein said gas injection tube comprises a quartz tube.

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79. The reactor according to Claim 63, where said supply tube comprises a quartz tube.

80. The reactor according to Claim 63, wherein said gas injection assembly includes at least two gas injection tubes, one of said gas injection tubes injecting a first gas in said processing chamber, and a second of said gas injection tubes injecting a second gas in said processing chamber, and said gas injection assembly ionizing at least one of said first and second gases into a gas plasma for injecting into said processing chamber.

81. The reactor according to Claim 63, wherein said plasma generator includes a generator tube and a coil inducing an electromagnetic field in said generator tube to ionize the gas flowing through the generator tube, and said generator tube directing the ionized gas to said gas injector for injecting into said processing chamber.

82. The reactor according to Claim 63, wherein said orifices are uniformly spaced along said elongate tube.

83. The reactor according to Claim 63, wherein said housing includes a cover, said gas injector being supported in said cover.

84. The reactor according to Claim 63, further comprising a heater for heating the substrate in said processing chamber.

85. The reactor according to Claim 63, wherein said heater is enclosed in a heater housing, said heater housing being supported in said reactor housing.

86. The reactor according to Claim 63, wherein said heater housing provides support for the substrate in said reactor housing.